Matteo Mantovani

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Professional Experiences

2023/03 - Present

Assistant Professor, *University of Verona*, Italy
Project title: HEAL ITALIA - Health Extended ALliance for Innovative Therapies, Advanced Lab-research, and Integrated Approaches of Precision Medicine
Main research: Create a swarm learning framework simultaneously addressing the need for distributed learning with large medical datasets while ensuring confidentiality and privacy-preserving requirements. This will allow users to share model parameters via the Swarm network and build the models independently on private data at the individual sites (swarm nodes). Furthermore, the research focuses on the scalability of the swarm learning network, based on the impact of the nodes and their data.
Grant: European Union—NextGenerationEU through the Italian Ministry of University and Research under PNRR—M4C2-I1.3 Project PE_00000019 "HEAL ITALIA" to the authors CUP B33C22001030006

2022/07 - 2023/02

Postdoctoral Research Fellow, *University of Verona*, Italy
Main research: Fit to Fight - A BPM-based platform to support activities for patients waiting for pancreatic surgery and, in particular, in optimizing their waiting times with a preoperative phase of preparation and information gathering through multimedia or textual contents.

2020/01 - 2022/06

Postdoctoral Research Fellow, *University of Verona*, Italy
Project title: FARm - Filiera dell'Agricoltura Responsabile (responsible agriculture supply chain)
Grant: AMIF (Asylum, Migration and Integration Fund) 2014-2020, European Union, Ministry of the Interior and Ministry of Labour and Social Policies, lett. i-ter - 2019-2021 - Prog. n. 2968 – CUP: B38D19004710007

2016/01 - 2016/10

Project Engineer, *Arsenàl.it - Veneto's Research Centre for eHealth Innovation - Treviso*, Italy
Design, develop and maintenance of the regional Electronic Health Record (FSEr) both client-side and server-side using Pentaho Business Analytics, Pentaho Data Integration and HP Vertica (NO-SQL). Design and develop extract/transform/load (ETL) routines on their database system to adapt it to data mining algorithms.

2015/05 - 2015/12	**Developer**, *Dstech @ Accenture*, Italy Develop of a MVC web-app for desktop and mobile, using AngularJS, Bootstrap e IBM Worklight. Developing and testing the proof-of-concept web-app.

Education

2016/10 - 2019/09	**PhD Program in Computer Science**, *University of Verona*, Italy Thesis: "Approximate Data Mining Techniques on Clinical Data" PhD Defense: 27th May 2020 Advisor: Prof. Carlo Combi See: PhD.1
2010/12 - 2013/07	**MsC in Computer Science and Engineering**, *University of Verona*, Italy Thesis: "Temporal Data Mining Techniques - Discovering approximate temporal functional dependencies based on sliding windows on healthcare datawarehouses." Advisor: Prof. Carlo Combi
2007/09 - 2010/11	**BsC in Engineering for Information and Organisation**, *University of Trento*, Italy Thesis: "Un prototipo multilayer per il calcolo dei costi dell'E-Learning (A multilayer prototype to calculate E-learning costs)" Advisor: Dott. Andrea Molinari

Visiting Experiences

2018/01 - 2018/06	**Visiting Scholar**, *Dept. of Computer Science, University of Pittsburgh*, Pittsburgh (USA) Project: Study and develop new predictive pattern mining algorithms for clinical data, with the help of machine learning techniques to validate them (see publication **C.3**) Supervisor: Prof. Milos Hauskrecht

Research Activities

The main research interests are in the field of **data mining, data analysis, distributed learning, and process-driven applications**, with a particular focus on the healthcare domain.
As far as the first two topics are concerned, the focus is on the problem of extracting insightful and unknown knowledge from clinical data. For this purpose, I proposed a new framework that groups different **approximate, temporal, and predictive data mining techniques.** As these

techniques produce a set of rules that have to be interpreted by medical experts, it is paramount that all the extracted information is represented in a human-friendly way, that is, in a concise and easy-to-understand form. The framework contains and combines temporal data mining techniques with prediction algorithms to analyze a dataset from multiple perspectives. The temporal aspect is key in the framework, as it allows us to analyze the temporal evolution of the data, a specific temporal pattern, or temporally predict a particular trend.
The framework integrates approximation techniques to handle outliers and poorly reported data, enabling the extraction of rules that are valid for the majority of the underlying data, rather than being restricted to those that strictly hold across the entire dataset.

During my period as assistant professor, the research is supported by grant *"European Union - NextGenerationEU through the Italian Ministry of University and Research under PNRR—M4C2-I1.3 Project PE_00000019 "HEAL ITALIA" to the authors CUP B33C22001030006"*. The main research interests are in the field of **distributed learning and process-driven applications**, with a particular focus on the healthcare domain.
As far as the first topics is concerned, the goal is to create a distributed learning framework simultaneously addressing the need for distributed network with large medical datasets while ensuring confidentiality and privacy-preserving requirements. This framework allows users to train the models locally on private data at the individual sites (distributed nodes) and to share only model parameters via the distributed network. Furthermore, the research examines the scalability of the learning network, assessing how network performance is influenced by the number of participating nodes and the characteristics of their data.
This investigation is motivated by the intrinsic challenges of multi-centric clinical environments, where direct data sharing across institutions is often restricted by privacy regulations, ethical considerations, and logistical constraints.

In this setting, my focus is on the **swarm learning** and **federated learning techniques**, as they support collaborative model development while maintaining data sovereignty at each site. Thus, the study explores the advantages of integrating heterogeneous clinical information distributed across multiple centers without compromising patient confidentiality.
In particular, I focused on the performance of the distributed network based on different data-distribution and overall nodes scenarios using the intensive care data from the MIMIC-III[7] and MIMIC-IV[6] datasets.
In **[C.8]**, the objective was to introduce new Key Performance Indicators (KPIs) to assess how different data-distribution scenarios affect a reference node already integrated into a swarm network. The analysis quantifies the benefits obtained both by the network as a whole and by the reference node when varying the number of participating nodes and their respective data distributions.
In **[J.3]**, we wanted to investigate the impact of an external node on an existing swarm learning network, considering different data-distribution scenarios and with a variable number of nodes. To properly evaluate this impact, we proposed several KPIs that analyzed the ICU data, the model stability, the feature distribution, and more indicators.

Finally, my research also focuses on **process-driven applications**, in which activities and tasks are modeled using the Business Process Model and Notation (**BPMN**). This approach is particularly relevant in healthcare, as it supports the formalization of clinical pathways and promotes the active involvement of clinicians in the design phase. BPMN serves as a common representation that can

be easily understood by both medical experts and developers, and it provides a basis for iterative modeling, testing, and refinement of processes. Involving clinicians from the earliest stages allows us to apply agile methodology principles, enabling them and developers to work iteratively from the initial design to digital mockups of the system, using process models as a shared reference to discuss, test, and refine requirements. An example can be found in *Fit to Fight*, a BPM-based platform to support activities for patients waiting for pancreatic surgery [**C.7**], developed with the direct involvement of the *Verona Pancreas Institute*, the first interdisciplinary center of excellence for diagnosing and treating pancreatic diseases in Italy. *Fit to Fight* also served as a case study to define a migration framework to be used when patients are reassigned from one clinical pathway to another due to a change in their clinical conditions. The migration framework includes different techniques to "compensate" for the required changes, ensuring continuity of care while maintaining the coherence of the underlying process model [**C.9**]. Another example is represented by Blood pressure Easy Access Telemedicine *BEAT* [**C.10**], an agile framework for telemedicine in hypertension. It integrates BPMN to formalize clinical workflows for both synchronous and asynchronous scenarios, and it includes digital mock-ups to create intuitive user interfaces and a robust database schema to store and manage temporally evolving clinical data. *BEAT* adopts the agile methodology principles, involving clinicians from the *Italian Society of Hypertension* to provide iterative refinement through their feedback, and to ensure the alignment with real-world requirements.

There is also a non healthcare-related example, which is *FARmAPP* [**C.6**], the final deliverable of the FARm project *[Grant: AMIF (Asylum, Migration and Integration Fund) 2014-2020, European Union, Ministry of the Interior and Ministry of Labour and Social Policies, lett. i-ter - 2019-2021 - Prog. n. 2968 – CUP: B38D19004710007*]. *FARmAPP* is a process-driven application that uses the BPM notation to formalize the recruitment processes in agriculture. It was designed and developed through an agile approach with recruitment agencies, and it supports them and farms by improving job intermediation, helping to prevent and counter illegal recruitment practices. It supports responsible agricultural practices and the protection of labor rights by structuring information exchange, communication, and matching between demand and supply in the agricultural labor market, improving efficiency and transparency.

The main topics in my research are:

- Distributed learning (Swarm Learning - Federated Learning)
  - Journal: [**J.3**]
  - Conferences: [**C.8**]
  - Advising: **Th.9**, **Th.8**
- BPMN or BPMN Process-driven application
  - Conference: [**C.10**], [**C.9**], [**C.7**], [**C.6**]
  - Advising: **Th.7**, **Th.6**, **Th.5**, **FP.6**, **FP.5**, **FP.4**, **FP.3**, **FP.2**, **Ib.3**, **Ib.2**, **Ib.1**
- Agile methodology
  - Conference: [**C.10**], [**C.9**], [**C.7**], [**C.6**]
  - Advising: **Th.7**, **Th.6**, **Th.5**, **FP.9**, **FP.8**

- (Approximate | temporal) functional dependencies
  Journals: [**J.1**], [**J.2**]
  Conferences: [**C.1**], **DC.1**, **WwR.1**
- (Temporal) association rules
  Conference: [**C.3**]
  Advising: **Th.3**
- (Approximate | temporal) pattern mining
  Conferences: [**C.5**] [**C.4**], [**C.3**], [**C.2**],
  Advising: **Th.4**, **Th.2**, **Th.2**, **FP.7**, **FP.6**, **FP.1**
- Predictive algorithms
  Conferences: [**C.5**] [**C.4**], [**C.3**],
  Advising: **Th.4**

Research Groups Membership

2023 - Present	University of Verona - Department of Computer Science Member of the "HEAL ITALIA" group - **Official website** SPOKE 2 Intelligent health - Health Data Science: Data management and development of advanced methods, algorithms, and machine learning approaches integrating health big data. Through an efficient data management and development of advanced methods, algorithms, and machine learning approaches integrating health big data, Spoke 2 will establish a model of a collaborative data and analysis platform in full compliance with the Italian privacy legislation for enabling the processing of predictive computer models on large volumes of digital heterogeneous data, opening new avenues for modern healthcare and personalized medicine. The main research in the department of Computer Science focuses on the design and development of swarm learning solutions and their adoption in healthcare-oriented scenarios. In particular, the focus is to create a stable swarm learning network between University of Verona, University of Bologna, and University of Rome "Tor Vergata". The HEAL ITALIA group is funded by: European Union—NextGenerationEU through the Italian Ministry of University and Research under PNRR—M4C2-I1.3 Project PE_00000019 "HEAL ITALIA" to the authors CUP B33C22001030006.

2020 - 2023

University of Verona - Department of Computer Science
Member of the "FARm - Filiera dell'Agricoltura Responsabile" group - **UniVr Link - Official website**

The FARm group is an interdisciplinary group that aims to prevent and oppose illegal recruitment in agriculture, tackling the problem with different approaches. In particular, it focuses on three regions in Northern Italy: Veneto, Lombardy, and Trentino-Alto Adige. It involves different partners from these regions, such as three recruitment agencies, two public institutions, ten private companies, and four universities (i.e., the University of Verona, the University of Milan, the University of Trento, and the Free University of Bozen-Bolzano).

The University of Verona has the role of coordinating and managing the whole group. At the University of Verona, the FARm group involves four different departments, that are: dept. of Computer Science; dept. of Neurosciences, Biomedicine and Movement Sciences; dept. of Diagnostics and Public Health; and dept. of Law.
The main research in the department of Computer Science focuses on the design and development of business process models and their adoption in process-driven applications.
The FARm group is funded by: AMIF (Asylum, Migration and Integration Fund) 2014-2020, European Union, Ministry of the Interior and Ministry of Labour and Social Policies, lett. i-ter - 2019-2021 - Prog. n. 2968 – CUP: B38D19004710007.

2013 - Present

University of Verona - Department of Computer Science
Member of the "Databases and Information Systems" group - **Link**

The group of databases and information systems of the Department of Computer Science at the University of Verona deals with the theoretical, methodological and technological aspects of the management of information in complex organizations.
The research activities are focused on the following topics: Temporal information systems; Web information systems; Healthcare information systems; Spatio-temporal information;

Organization Activities

Leading Conference Roles

2026 | **Workshop co-chair** for *The 3rd Workshop on Data Privacy and Data Analysis in Healthcare Systems (DPDAHS)* in conjunction with the *IEEE International Conference on Healthcare Informatics 2026 (IEEE ICHI 2026)* - Workshop Site - Conference Site.

2025 | **Workshop co-chair** for *The Workshop on AI in Big Data Analytic for Healthcare* in conjunction with the *2025 IEEE International Conference on Big Data (IEEE BigData 2025)* - Workshop Site - Conference Site.

2025 | **Workshop co-chair** for *The 2nd Workshop on Data Privacy and Data Analysis in Healthcare Systems (DPDAHS)* in conjunction with the *IEEE International Conference on Healthcare Informatics 2025 (IEEE ICHI 2025)* - Workshop Site - Conference Site.

2024 | **Workshop co-chair** for *The 3rd Workshop on Big Data Analytic in Healthcare* in conjunction with the *2024 IEEE International Conference on Big Data (IEEE BigData 2024)* - Workshop Site - Conference Site.

2024 | **Workshop co-chair** for the *Workshop on Data Privacy and Data Analysis in Healthcare Systems (DPDAHS)* in conjunction with the *IEEE International Conference on Healthcare Informatics 2024 (IEEE ICHI 2024)* - Workshop Site - Conference Site.

2023 | **Workshop co-chair** for *The 2nd Workshop on Big Data Analytic in Healthcare* in conjunction with the *2023 IEEE International Conference on Big Data (IEEE BigData 2023)* - Workshop Site - Conference Site.

Conference Organization and Committee Membership

2026 | **Program Committee member** for *IEEE International Conference on Healthcare Informatics 2026 (IEEE ICHI 2026).*

2026 | **Publication co-chair** for *Conference on Advanced Information Systems Engineering 2026 (CAiSE 2026).*

2025 | **Program Committee member** for *The Workshop on AI in Big Data Analytic for Healthcare.*

2025 | **Program Committee member** for *IEEE International Conference on Healthcare Informatics 2025 (IEEE ICHI 2025).*

2025 | **Program Committee member** for *The 2nd Workshop on Data Privacy and Data Analysis in Healthcare Systems (DPDAHS).*

2025	**Program Committee member** for *2nd International Workshop on Artificial Intelligence for Neuroscience (IWAIN'25).*
2025	**Publication co-chair** for *IEEE International Conference on Healthcare Informatics 2025 (IEEE ICHI 2025).*
2024	**Program Committee member** for *Workshop on Data Privacy and Data Analysis in Healthcare Systems (DPDAHS).*
2024	**Program Committee member** for *The 3rd Workshop on Big Data Analytic in Healthcare.*
2024	**Program Committee member** for *IEEE International Conference on Healthcare Informatics 2024 (IEEE ICHI 2024).*
2024	**Program Committee member** for *1st International Workshop on Artificial Intelligence for Neuroscience (IWAIN'24).*
2023	**Program Committee member** for *The 2nd Workshop on Big Data Analytic in Healthcare.*
2023	**Program Committee member** for *IEEE International Conference on Healthcare Informatics 2023 (IEEE ICHI 2023).*
2023	**Publication co-chair** for *IEEE International Conference on Healthcare Informatics 2023 (IEEE ICHI 2023).*
2022	**Publication co-chair** for *IEEE International Conference on Healthcare Informatics 2022 (IEEE ICHI 2022).*
2021	**Publication co-chair** for *IEEE International Conference on Healthcare Informatics 2021 (IEEE ICHI 2021).*
2019	**Organizing committee member** for *IEEE Winter School on Imaging Genetics 2019*
2019	**Web chair** for *IEEE Winter School on Imaging Genetics 2019*

Journal Reviewing Activities

2024	Reviewed for BMC Bioinformatics, Springer Nature
2020 - Ongoing	Reviewed for Artificial Intelligence in Medicine, Elsevier

University Committees

2024/Ongoing	Member of the *Tutoring service provided by faculty members*
2023/Ongoing	Member of the *Computer Science Department Council*
2023/Ongoing	Member of the *Computer Science Teaching Committee*
2022/2023	Member of the *Mathematics and Data Science Teaching Committee*
2021/2022	Member of the *Mathematics Teaching Committee*
2022/2023 2021/2022	Member of the *Communication Studies Teaching Committee*

Teaching

2025 - 2026	University of Verona - Department of Computer Science Teaching & Coordinator, "*Data Analysis Techniques on Healthcare Data*" - PhD in Computer Science SSD: INFO/01 - Computer Science Course credits: 3 - Teaching credits: 3 Teaching hours: 12
2025 - 2026	University of Verona - Department of Computer Science Teaching, "*Healthcare Information Systems*" - Master's degree in Medical Bioinformatics SSD: INFO/01 - Computer Science Course credits: 6 - Teaching credits: 3 Teaching hours: 24
2024 - 2025	University of Verona - Department of Computer Science Teaching, Laboratory of "*Introduction to Programming*" - Bachelor's degree in Bioinformatics SSD: INF/01 - Computer Science Course credits: 12 - Teaching credits: 3 Teaching hours: 36
2023 - 2024	University of Verona - Department of Computer Science Teaching, Laboratory of "*Introduction to Programming*" - Bachelor's degree in Bioinformatics SSD: INF/01 - Computer Science Course credits: 12 - Teaching credits: 4 Teaching hours: 48

2022 - 2023
University of Verona - Faculty of Medicine and Surgery
Teaching, "*Information Technology*" - Scuola di Specializzazione in Farmacologia e Tossicologia Clinica (D.I. 68/2015)
SSD: INF/01 - Computer Science
Teaching hours: 3

2022 - 2023
2021 - 2022
University of Verona - Department of Cultures and Civilizations
Teaching & Coordinator, "*Documental Information Technology*" - Bachelor's degree in Communication Studies
SSD: INF/01 - Computer Science
Course credits: 6 - Teaching credits: 6
Teaching hours: 36

2022 - 2023
2021 - 2022
University of Verona - Department of Computer Science
Teaching, Laboratory of "*Computer Programming with Laboratory*" - Bachelor's degree in Applied Mathematics
SSD: INF/01 - Computer Science
Course credits: 12 - Teaching credits: 3
Teaching hours: 36

2018 - 2019
University of Verona - Department of Computer Science
Teaching assistant, Laboratory of "*Databases*" - Bachelor's degree in Computer Science
SSD: ING-INF/05 - Information Processing Systems
Teaching hours: 18

2018 - 2019
University of Verona - Department of Computer Science
Teaching assistant, Laboratory of "*Databases and Web*" - Bachelor's degree in Bioinformatics
SSD: INF/01 - Computer Science
Teaching hours: 18

2017 - 2018
University of Verona - Department of Computer Science
Teaching assistant, Laboratory of "*Data-intensive computing systems*" - Master's degree in Computer Science and Engineering
SSD: ING-INF/05 - Information Processing Systems
Teaching hours: 24

2016 - 2017
University of Verona - Department of Computer Science
Teaching assistant, Lab. of Databases - Bachelor's degree in Computer Science
SSD: ING-INF/05 - Information Processing Systems
Teaching hours: 18

Presentations at Conferences/Workshops

2025 - Oral presentation for: **[C.10]**	**IEEE International Conference on Healthcare Informatics (ICHI 2025)**. Rende (CS), Italy. June 18-21, 2025
2024 - Oral presentation for: **[C.8]**	**IEEE International Conference on Healthcare Informatics (ICHI 2024)**. Orlando, FL, USA. June 3-6, 2024
2023 - Oral presentation for: **[C.7]**	**IEEE International Conference on Healthcare Informatics (ICHI 2023)**. Houston, TX, USA. June 26-29, 2023
2022 - Oral presentation for: **[C.6]**	**IEEE International Symposium on Technology and Society 2022 (ISTAS22)**. Virtual Conference. Nov 10-12, 2022
2021 - Oral presentation for: **[C.4]**	**The 36th ACM/SIGAPP Symposium On Applied Computing (SAC2021)**. Virtual Conference. Mar 22-26, 2021
2019 - Oral presentation for: **[C.3]**	**17th Conference on Artificial Intelligence in Medicine (AIME 2019)**. Poznan, Poland. June 26-29, 2019
2019 - Oral presentation for: **[C.2]**	**IEEE International Conference on Healthcare Informatics (ICHI 2019)**. Xi'an, China. June 10-13, 2019
2017 - Oral presentation for: **[C.1]** and **DC.1**	**IEEE International Conference on Healthcare Informatics (ICHI 2017)**. Park City, UT, USA. Aug 23-26, 2017
2016 - Oral presentation for: **WwR.1**	**3^{rd} Workshop on Data Mining for Medical Informatics: Learning Health** held in conjunction with AMIA 2016 Annual Symposium. Chicago, IL, USA. Nov 12, 2016

Sessions chairing at Conferences/Workshops

2025	**The 2nd Workshop on Data Privacy and Data Analysis in Healthcare Systems (DPDAHS)** in conjunction with the *IEEE International Conference on Healthcare Informatics 2025 (IEEE ICHI 2025)*
2024	**The 3rd Workshop on Big Data Analytic in Healthcare** in conjunction with the *2024 IEEE International Conference on Big Data (IEEE BigData 2024)*
2024	**Workshop on Data Privacy and Data Analysis in Healthcare Systems (DPDAHS)** in conjunction with the *IEEE International Conference on Healthcare Informatics 2024 (IEEE ICHI 2024)*
2023	**The 2nd Workshop on Big Data Analytic in Healthcare** in conjunction with the *2023 IEEE International Conference on Big Data (IEEE BigData 2023)*

Attended Conferences/Workshops

IEEE International Conference on Healthcare Informatics (ICHI 2025). Rende (CS), Italy. June 18-21, 2025

2024 IEEE International Conference on Big Data (IEEE BigData 2024). Washington, DC, USA. Dec 15-18, 20234

IEEE International Conference on Healthcare Informatics (ICHI 2024). Orlando, FL, USA. June 3-6, 2024

2023 IEEE International Conference on Big Data (IEEE BigData 2023). Sorrento (NA), Italy. Dec 15-18, 2023

IEEE International Conference on Healthcare Informatics (ICHI 2023). Houston, TX, USA. June 26-29, 2023

IEEE International Symposium on Technology and Society 2022 (ISTAS22). Virtual Conference, Nov 10-12, 2022

IEEE International Conference on Healthcare Informatics (ICHI 2022). Rochester, MN, USA. Jun 11-14, 2022.

The 36th ACM/SIGAPP Symposium On Applied Computing (SAC2021). Virtual Conference, Mar 22-26, 2021

IEEE International Conference on Healthcare Informatics (ICHI 2020). Virtual Conference, Nov 30 - Dec 3, 2020.

IEEE International Conference on Process Mining (ICPM 2020). Virtual Conference, Oct 4-9, 2020.

17th Conference on Artificial Intelligence in Medicine (AIME 2019). Poznan, Poland, June 26-29, 2019.

IEEE International Conference on Healthcare Informatics (ICHI 2019). Xi'an, China, June 10-13, 2019.

IEEE International Conference on Healthcare Informatics (ICHI 2017). Park City, UT, USA. Aug 23-26, 2017.

3rd Workshop on Data Mining for Medical Informatics: Learning Health held in conjunction with AMIA 2016 Annual Symposium. Chicago, IL, USA. Nov 12, 2016.

AMIA 2016 Annual Symposium. Chicago, IL, USA. Nov 12-16, 2016.

Publications

Journals

2025 | **[J.3] Matteo Mantovani**, Simone Scaglia, Riccardo Scheda, Carlo Combi, and Stefano Diciotti. Swarm learning and clinical data: Evaluating the benefit of a new node for the whole network. *Journal of Healthcare Informatics Research*, Under review

2020 [**J.2**] Pietro Sala, Carlo Combi, **Matteo Mantovani**, and Romeo Rizzi. Discovering evolving temporal information: Theory and application to clinical databases. *SN Computer Science*, 1(3):153, May 2020. doi:10.1007/s42979-020-00160-9

2015 [**J.1**] Carlo Combi, **Matteo Mantovani**, Alberto Sabaini, Pietro Sala, Francesco Amaddeo, Ugo Moretti, and Giuseppe Pozzi. Mining approximate temporal functional dependencies with pure temporal grouping in clinical databases. *Comp. in Bio. and Med.*, 62:306–324, 2015. doi:10.1016/j.compbiomed.2014.08.004

Articles in International Conferences with Referees

2025 [**C.10**] **Matteo Mantovani**, Denise Cosolo, Francesco Pio Anzillotti, Cristiano Fava, Pietro Minuz, and Carlo Combi. BEAT - an agile design framework for telemedicine in hypertension. In *13th IEEE International Conference on Healthcare Informatics, ICHI 2025, Rende, CS, Italy, June 18-21, 2025*, pages 518–528. IEEE, 2025. doi:10.1109/ICHI64645.2025.00065

2024 [**C.9**] **Matteo Mantovani**, Emanuele Chini, and Carlo Combi. A migration framework for active BPMN processes in healthcare. In *12th IEEE International Conference on Healthcare Informatics, ICHI 2024, Orlando, FL, USA, June 3-6, 2024*, pages 332–343. IEEE, 2024. doi:10.1109/ICHI61247.2024.00050

2024 [**C.8**] **Matteo Mantovani**, Riccardo Scheda, Carlo Combi, and Stefano Diciotti. A key performance indicator to analyze swarm learning performances with EHR. In *12th IEEE International Conference on Healthcare Informatics, ICHI 2024, Orlando, FL, USA, June 3-6, 2024*, pages 620–625. IEEE, 2024. doi:10.1109/ICHI61247.2024.00099

2023 [**C.7**] **Matteo Mantovani**, Andrea Caravati, Giuseppe Pozzi, Carlo Combi, and Roberto Salvia. A BPMN- based framework to manage ERAS-inspired pathway for patients undergoing pancreatic surgery. In *2023 IEEE 11th International Conference on Healthcare Informatics (ICHI)*, pages 21–31, 2023. doi:10.1109/ICHI57859.2023.00015

2022 [**C.6**] **Matteo Mantovani** and Carlo Combi. FARmAPP: a process-driven solution to prevent and oppose illegal recruitment in agriculture in northern italy. In *2022 IEEE International Symposium on Technology and Society (ISTAS22)*, volume 1, pages 1–8, 2022. doi:10.1109/ISTAS55053.2022.10227121

2022 [**C.5**] Stela Golovco, **Matteo Mantovani**, Carlo Combi, and John H. Holmes. Acute kidney injury prediction with gradient boosting decision trees enriched with temporal features. In *2022 IEEE 10th International Conference on Healthcare Informatics (ICHI)*, pages 669–676, 2022. doi:10.1109/ICHI54592.2022.00135

2021 [**C.4**] **Matteo Mantovani**, Beatrice Amico, and Carlo Combi. Discovering predictive trend-event patterns in temporal clinical data. In *The 36th ACM/SIGAPP Symposium on Applied Computing (SAC '21), March 22–26, 2021, Virtual Event, Republic of Korea*, SAC '21. Association for Computing Machinery, 2021. doi:10.1145/3412841.3441937

2019 [**C.3**] **Matteo Mantovani**, Carlo Combi, and Milos Hauskrecht. Mining compact predictive pattern sets using classification model. In David Riaño, Szymon Wilk, and Annette ten Teije, editors, *Artificial Intelligence in Medicine - 17th Conference on Artificial Intelligence in Medicine, AIME 2019, Poznan, Poland, June 26-29, 2019, Proceedings*, volume 11526 of *Lecture Notes in Computer Science*, pages 386–396. Springer, 2019. doi:10.1007/978-3-030-21642-9_49

2019 [**C.2**] **Matteo Mantovani**, Carlo Combi, and Matteo Zeggiotti. Discovering and analyzing trend-event patterns on clinical data. In *2019 IEEE International Conference on Healthcare Informatics, ICHI 2019, Xi'an, China, June 10-13, 2019*, pages 1–10. IEEE, 2019. doi:10.1109/ICHI.2019.8904774

2017 [**C.1**] Carlo Combi, **Matteo Mantovani**, and Pietro Sala. Discovering quantitative temporal functional dependencies on clinical data. In *2017 IEEE International Conference on Healthcare Informatics, ICHI 2017, Park City, UT, USA, August 23-26, 2017* [1], pages 248–257. doi:10.1109/ICHI.2017.80

Ph.D. Thesis

2020 [**PhD.1**] Matteo Mantovani. *Approximate Data Mining Techniques on Clinical Data*. PhD thesis, University of Verona, 2020. URL: https://hdl.handle.net/11562/1018039

Doctoral Consortium

2017 [**DC.1**] **Matteo Mantovani**. Approximate temporal functional dependencies on clinical data. In *2017 IEEE International Conference on Healthcare Informatics, ICHI 2017, Park City, UT, USA, August 23-26, 2017* [1], page 328. doi:10.1109/ICHI.2017.30

Articles in International Workshops without Referees

2016	[**WwR.1**] Carlo Combi, **Matteo Mantovani**, and Pietro Sala. Approximate functional dependencies for expressing trend-event correlations: proposal and applications in the clinical domain. In *3rd Workshop on Data Mining for Medical Informatics (DMMI)-Learning Health held in conjunction with AMIA 2016 Annual Symposium.*, 2016

Advising

Advisor or Co-Advisor for the following M.Sc. theses (marked as [**Th.x**])

2025/Ongoing	[**Th.9**] *Simone Scaglia*, Topic: "Analysis performance comparison between different swarm learning frameworks, analysis of the influence of a new node in a swarm network under different conditions, and analysis of different learning algorithms in a swarm environment", M.Sc. in Medical Bioinformatics - Dept. of Computer Science - University of Verona. Advisor: prof. Carlo Combi
2024/Ongoing	[**Th.8**] *Dawit Gebremariam Aboset*, "Multicentric clinical data analysis with swarm learning", M.Sc. in Medical Bioinformatics - Dept. of Computer Science - University of Verona. Advisor: prof. Carlo Combi
2023/2025	[**Th.7**] *Denise Cosolo*, "BEAT - An agile design framework for telemedicine-based hypertension management - A user-centered approach to the GUI development", M.Sc. in Medical Bioinformatics - Dept. of Computer Science - University of Verona. Advisor: prof. Carlo Combi
2023/2025	[**Th.6**] *Francesco Pio Anzillotti*, "BEAT - An agile design framework for telemedicine-based hypertension management - Process-driven and data-aware issues", M.Sc. in Medical Bioinformatics - Dept. of Computer Science - University of Verona. Advisor: prof. Carlo Combi
2022/2023	[**Th.5**] *Emanuale Chini*, Topic: Design and Develop a process-driven application used by clinicians to assist patients waiting for pancreatic cancer surgery, M.Sc. in Medical Bioinformatics - Dept. of Computer Science - University of Verona. Advisor: prof. Carlo Combi
2021/2022	[**Th.4**] *Stela Golovco*, "Prediction of the risk of acute kidney injury in critical care unit based on Trend-Event Features", M.Sc. in Medical Bioinformatics - Dept. of Computer Science - University of Verona. Advisor: prof. Carlo Combi

2019/2020	**[Th.3]** *Elena Segato*, "Discovering Trend-Event-Pattern (TEP) Association Rules in biomedical data sets", M.Sc. in Medical Bioinformatics - Dept. of Computer Science - University of Verona. Advisor: prof. Carlo Combi
2019/2020	**[Th.2]** *Marco Zandon*, "Discovering Mixed Trend-Event Features (M-TEF) in MIMIC-III, an open-access Intensive Care Unit database", M.Sc. in Medical Bioinformatics - Dept. of Computer Science - University of Verona. Advisor: prof. Carlo Combi
2019/2020	**[Th.1]** *Luca Gentilin*, "Conceptual design and cleaning of public critical care databases", M.Sc. in Medical Bioinformatics - Dept. of Computer Science - University of Verona. Advisor: prof. Carlo Combi

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Advisor or Co-Advisor for the following B.Sc. final projects ([**FP.x**]) and internships ([**Ib.x**])

2024/Ongoing	**[Ib.4]** *Giovanni Andreotti*, Topic: Design & Development of a containerizable application for the dose reduction of antidepressants in psychiatry - a front-end focus, BsC in Computer Science. Advisor: prof. Carlo Combi
2024/Ongoing	**[FP.7]** *Riccardo Marchiori*, Topic: Design & Development of a containerizable application for the dose reduction of antidepressants in psychiatry - a back-end focus, BsC in Computer Science. Advisor: prof. Carlo Combi
2024	**[FP.6]** *Anna Smetanina*, Topic: Design & Development of a software for trend-event patterns' multidimensional analysis, BsC in Computer Science. Advisor: Matteo Mantovani
2023	**[Ib.3]** *Samuele Vezzoli*, Topic: Design & Development of unit tests and other test techniques for an Angular/NodeJS web-app, BsC in Bioinformatics. Advisor: prof. Carlo Combi
2020/2021	**[Ib.2]** *Giordano Bellini*, Topic: Design & Development of UI for an Angular/NodeJS web-app, BsC in Computer Science. Advisor: prof. Carlo Combi
2020/2021	**[FP.5]** *Luca Farina*, "Progettazione e realizzazione di un sottosistema basato su web per la gestione dei dati di lavoratori stagionali" (Design and development of a web-based system for the management of seasonal workers' data), BsC in Computer Science. Advisor: prof. Carlo Combi

2020/2021	**[Ib.1]** *Joshua Chapman*, Topic: Design, Development, Refactoring, Optimization, and Testing of an Angular/NodeJS web-app, BsC in Computer Science - Dept. of Computer Science - University of Verona. Advisor: prof. Carlo Combi
2020/2021	**[FP.4]** *Michelle Zanotti*, "FARmAPP: un'app per la raccolta e analisi dati per contrastare il caporalato. Identificazione di possibili situazioni di rischio" (FARmAPP: an app to collect and analyze data to oppose illegal recruitment), BsC in Computer Science. Advisor: prof. Carlo Combi
2020/2021	**[FP.3]** *Valentino Scevaroli*, "Sviluppo di un prototipo di applicazione per la lotta al caporalato in agricoltura (FARMApp)" (Development of an application prototype to oppose illegal recruitment in agriculture (FARmAPP)), BsC in Computer Science. Advisor: prof. Carlo Combi
2019/2020	**[FP.2]** *Francesco Fattori*, "Sviluppo di una applicazione web a supporto della prevenzione del caporalato in agricoltura" (Development of a web application to support the prevention of illegal recruitment in agriculture), BsC in Computer Science. Advisor: prof. Carlo Combi
2018/2019	**[FP.1]** *Matteo Zeggiotti*, "Sviluppo di tecniche di analisi di pattern temporali basati su eventi per dati di terapia intensiva" (Development of techniques to analyze temporal patterns based on events for intensive care data), BsC in Computer Science. Advisor: prof. Carlo Combi

Language Certifications

2019	**CEFR Level: C2**	Certificate of Achievement after attending the General English course at the University of Verona with *SpeakYourMind School*

I authorize the processing of my personal data for personnel research and selection purposes under D.Lgs. n.196 of 30/06/2003.

Dichiarazione sostitutiva di certificazione e dell'atto di notorietà ai sensi degli artt. 46 e 47 e degli artt. 75 e 76 del DPR 445/2000 e successive modificazioni ed integrazioni.

Il sottoscritto *Matteo Mantovani* a conoscenza di quanto prescritto dall'art. 76 del D.P.R. 28 dicembre 2000 n. 445, sulla responsabilità penale cui può andare incontro in caso di falsità in atti e di dichiarazioni mendaci, nonché di quanto prescritto dall'art. 75 del D.P.R. 28 dicembre 2000 n. 445, sulla decadenza dai benefici eventualmente conseguenti al provvedimento emanato sulla base di dichiarazioni non veritiere, ai sensi e per gli effetti del citato D.P.R. n. 445/2000 e sotto la propria personale responsabilità:

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che tutte le informazioni contenute nel proprio curriculum vitae sono veritiere.

Last updated: December 22, 2025